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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,959	03/31/2004	Kutay F. Ustuner	2004P01660US	8319

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Siemens Corporation  
Intellectual Property Department  
170 Wood Avenue South  
Iselin, NJ 08830

EXAMINER

LAMPRECHT, JOEL

ART UNIT PAPER NUMBER

3737

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/09/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

**Application No.**

10/814,959

**Applicant(s)**

USTUNER ET AL.

**Examiner**

Joel M. Lamprecht

**Art Unit**

3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed..
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/31/04</u> | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-20, 27, 30-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Ustuner et al. (US 2005/0033165). Ustuner et al. disclose and teach a method for adaptive ultrasound comprising obtaining data from multiple transducer elements [0002, 0017, 0018], determining a coherence factor [0022, 0024, 0042-0044], and setting beamforming parameters as a function of the CF [0042-0044]. Additionally they disclose calculation of phase variance [0020-0021, 0040-0043, 0046-0048], calculating the CF as a function of data altered by beamforming delays [0020, 0042-0045], setting a transmit beamforming parameter [0003, 0053-0055], setting a receive beamforming parameter for receiving acoustic energy [0008, 0048-0050], setting an aperture size as a function of a coherence factor [0045, 0037-0039, 0033], setting an apodization profile and phase profile as a function of coherence factor [0005, 0029, 0036-0039, 0041-0041, 0048-0049], setting an image forming parameter as a function of coherence factor [Claims 1-9], and setting a complex aperture parameter as at least two of apodization, delay, or phase profile, and aperture size [0025 0039 0051-0053]. Ustuner et al. also disclose a system containing a transducer [0017-0025], a processor for determining

coherence factor [0042-0044], a beamformer connected to the transducer [0042-0048], responsive to coherence factor (transmit, receive functions included), setting a parameter for synthesis (averaging) or compounding, setting a coherence factor as a function of the coherent sum to an incoherent sum, calculating phase variance across transducers, [0042-0052], calculating coherence factors as a function of data modified by beamforming delays prior to summation [0023-0025]. Finally, Ustuner et al. disclose setting a dynamic range, nonlinear filter, and nonlinear map as a function of coherence factor [0022, 0028-0030, 0034, 0037, 0055].

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ustuner et al. in view of Sumanaweera et al. (US 2005/0093859). Ustuner et al. disclose all that is listed above, mainly a method for adaptive ultrasound comprising obtaining data from multiple transducer elements [0002, 0017, 0018], determining a coherence factor [0022, 0024, 0042-0044], and setting beamforming parameters as a function of the CF [0042-0044]. Additionally they disclose calculation of phase variance [0020-0021, 0040-0043, 0046-0048], calculating the CF as a function of data altered by beamforming delays [0020, 0042-0045], setting a transmit beamforming parameter [0003, 0053-0055], setting a receive beamforming parameter for receiving acoustic

energy [0008, 0048-0050], setting an aperture size as a function of a coherence factor [0045, 0037-0039, 0033], setting an apodization profile and phase profile as a function of coherence factor [0005, 0029, 0036-0039, 0041-0041, 0048-0049], setting an image forming parameter as a function of coherence factor [Claims 1-9], and setting a complex aperture parameter as at least two of apodization, delay, or phase profile, and aperture size [0025 0039 0051-0053]. Ustuner et al. also disclose a system containing a transducer [0017-0025], a processor for determining coherence factor [0042-0044], a beamformer connected to the transducer [0042-0048], responsive to coherence factor (transmit, receive functions included), setting a parameter for synthesis (averaging) or compounding, setting a coherence factor as a function of the coherent sum to an incoherent sum, calculating phase variance across transducers, [0042-0052], calculating coherence factors as a function of data modified by beamforming delays prior to summation [0023-0025]. Finally, Ustuner et al. disclose setting a dynamic range, nonlinear filter, and nonlinear map as a function of coherence factor [0022, 0028-0030, 0034, 0037, 0055].

5. Ustuner et al. do not disclose specific methods for setting simultaneous beams, sequential beams, sub apertures, compounding beams, setting multibeam parameters, summing data within subapertures, or using a compound processor. Attention is then directed to the secondary reference by Sumanaweera et al. which discloses setting a sub-aperture size [0050-0051, 0008], setting a number of simultaneous and sequential beams, setting a number of focal zones in a scan line, or sub apertures [0006-0009, 0038-0040, 0060-0063], setting a number of beams compounded together, transmitting

multibeam parameters, receiving multibeam parameters [0038-0040, 0060], and setting receive sub apertures as coherent sums within a sub aperture or an incoherent sum output of sub apertures [0055, 0068, 0065, 0063, 0051]. The processor of Sumanaweera et al. is capable of setting simultaneous beams, sub-apertures, scan line foci [0040-0044, 0060-0066]. Sumanaweera does not disclose a conventional compound processor, but it is well-known in the art at the time of the invention that a compound processor or any processor capable of performing such processing functions could be used within the invention as eluded to in [0031, 0040, and 0049]. It would have been obvious to one having ordinary skill in the art at the time of the invention to have used the multi-beam techniques disclosed within Sumanaweera et al. along with the ultrasound imaging methods disclosed within Ustuner et al. in order to process, and filter the most accurate ultrasound images possible at the time of the invention.

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure has been cited on the reference cited sheet for further viewing.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joel M. Lamprecht whose telephone number is (571) 272-3250. The examiner can normally be reached on Monday-Friday 7:30AM-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on (571)272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

3/2/07  
JML

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